

REMARKS

Claims 24-28, 31, and 33-47 remain pending and under current examination.

Regarding the Final Office Action:

In the Office Action,¹ the Examiner rejected claims 24-28, 31, and 33-47 under 35 U.S.C. § 103(a) as being unpatentable over Eldada (U.S. Patent No. 6,091,870) (“Eldada”) in view of Nesnidal et al. (U.S. Patent App. Pub. No. US2004/0022489A1) (“Nesnidal”). Applicants traverse the rejection for the following reasons.

Rejection of Claims 24-28, 31, and 33-47 under 35 U.S.C. § 103(a):

Applicants request reconsideration and withdrawal of the rejection of claims 24-28, 31, and 33-47 under 35 U.S.C. § 103(a) as being unpatentable over Eldada in view of Nesnidal. A *prima facie* case of obviousness has not been established.

To establish a *prima facie* case of obviousness, the prior art reference (separately or in combination) must teach or suggest all the claim limitations. See M.P.E.P. § 2142, 8th Ed., Rev. 5 (August 2006). “[I]n formulating a rejection under 35 U.S.C. § 103(a) based upon a combination of prior art elements, it remains necessary to identify the reason why a person of ordinary skill in the art would have combined the prior art elements in the manner claimed.” *USPTO Memorandum* from Margaret A. Focarino, Deputy Commissioner for Patent Operations, May 3, 2007, p. 2. “[T]he analysis supporting a rejection ... should be made explicit” and it is “important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the [prior art] elements in the manner claimed.” *Id.* (citing *KSR Int’l Co. v. Teleflex, Inc.*, No. 04-1350 (U.S. Apr. 30, 2007)).

¹ The Office Action contains statements characterizing the related art and the claims. Regardless of whether any such statements are specifically identified herein, Applicants decline to automatically subscribe to any statements in the Office Action.

A *prima facie* case of obviousness has not been established for at least the reason that the prior art, taken alone or in combination, fails to teach or suggest each and every element recited in independent claims 24, 41, and 43.

The Examiner essentially repeated the 35 U.S.C. § 103(a) rejection from the previous nonfinal Office Action, modified to track the language of the amended claims. As to independent claims 24 and 43, for example, the Examiner states that Eldada

does not describe[] a pair of the regions as a transmissive pair for a pass band with reflective pairs for reflecting optical signals within a stop band, for the grating structure described by Eldada to function to isolate a band of wavelengths (see Eldada at Column 1), there must be such a transmissive pair regions in the described grating. Final Office Action, pp. 2-3.

The Examiner also states that Eldada and Nesnidal do not “specifically describe a dimension varying between the dimensions of the light transmissive pairs of regions in a propagation direction. However, varying a dimension of light transmissive regions along a light propagation direction is well-known in producing apodized grating structures.” Final Office Action, p. 3.

The Examiner appears to be taking Official Notice (*see* M.P.E.P. § 2144.03) that “there must be such a transmissive pair [of] regions in the described grating” of Eldada, and that “varying a dimension of light transmissive regions along a light propagation direction is well-known in producing apodized grating structures.” Final Office Action, p. 3. Despite the Examiner’s allegations, Applicants submit that Eldada and Nesnidal still do not teach at least Applicants’ claimed “at least one dimension varies between the dimensions of the plurality of transmissive pairs of regions in a light propagation direction and a number of reflective pairs of

regions placed between consecutive transmissive pairs of regions” (claim 24, similar element in claim 43).

For example, Eldada’s col. 1, cited by the Examiner, discusses Bragg gratings and incorporates by reference two U.S. Patents, 5,574,807 to Snitzer and 5,636,309 to Henry. The above-quoted claim language does not read on any of Eldada, Snitzer, or Henry. Snitzer, for example, shows a pair of Bragg gratings 305, 315. See Snitzer, col. 7, ll. 49-65, and Fig. 3. Similarly, Henry shows a multiplicity of transmitters 411-41*n*. See Henry, col. 5, l. 63 to col. 6, l. 14. Neither Snitzer’s nor Henry’s teachings, however, constitute the claimed “plurality of transmissive pairs of regions [wherein] at least one dimension varies between the dimensions of the plurality of transmissive pairs of regions in a light propagation direction and a number of reflective pairs of regions placed between consecutive transmissive pairs of regions” (claim 24, similar element in claim 43).

Regarding the Examiner’s allegation that “there must be such a transmissive pair regions in the described grating” of Eldada, and that “varying a dimension of light transmissive regions along a light propagation direction is well-known in producing apodized grating structures” (Final Office Action, p. 3), Applicants challenge the Examiner’s presumed taking of Official Notice.

The burden is high for an Examiner to take Official Notice in a Final Office Action. See M.P.E.P. § 2144.03(A) (“these circumstances should be rare when an application is under final rejection”). In the present application, “Official notice unsupported by documentary evidence should only be taken by the examiner where the facts asserted to be well-known, or to be common knowledge in the art *are capable of instant and unquestionable demonstration as being well-known.*” M.P.E.P. § 2144.03(A) (emphasis added). Likewise,

[i]t would not be appropriate for the examiner to take official notice of facts without citing a prior art reference where the facts asserted to be well known are not capable of instant and unquestionable demonstration as being well-known. For example, assertions of technical facts in the areas of esoteric technology or specific knowledge of the prior art must always be supported by citation to some reference work recognized as standard in the pertinent art. M.P.E.P. § 2144.03(A) (emphasis in original).

Applicants therefore challenge the Examiner's taking of Official Notice as improper, as it is unsupported by documentary evidence, and, based on the applied references and knowledge available to one of ordinary skill in the art, is not capable of instant and *unquestionable* demonstration as being well known. Applicants will therefore "specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be common knowledge or well-known in the art." M.P.E.P. § 2144.03(C). So, "[i]f applicant adequately traverses the examiner's assertion of official notice, the examiner *must provide documentary evidence in the next Office action if the rejection is to be maintained.*" *Id.* (emphasis in original).

Applicants will discuss Eldada, followed by Nesnidal, to demonstrate that the Examiner's "noticed facts" are in error, and are not considered to be common knowledge or well-known in the art. Eldada teaches Mach-Zender (MZ) devices comprising regular Bragg gratings. For example, Eldada's col. 2, lines 1-7 teaches that a disadvantage of the prior art is that it is difficult to align Bragg gratings across the arms of the optical waveguides in the grating region. The cladding layers and the core layer are all made by photosensitive materials that can be treated with a source of energy (typically UV light) to differentiate one region of the material from another region. *See*, for example, Eldada, col. 3, line 59 to col. 4, line 5. When using photosensitive materials, gratings are made by printing using a photomask, as discussed, for

example, in Eldada's col. 8, lines 5-8. Applicants also note that gratings made by printing do not reach a high refraction index difference.

In Eldada's MZ device, each grating drops a signal of a predetermined wavelength from a signal having multiple wavelengths at ports 116 and 118, while at the output at port 120 includes all wavelengths except the two dropped wavelengths. See Eldada, col. 6, line 65 to col. 7, line 11.

More generally, as known from any optics book, a Bragg grating is constructed to reflect a particular wavelength and to transmit all others. This is achieved by adding a periodic variation to the refractive index where regions of refractive index n_1 are alternated with regions of index n_2 . In a conventional Bragg grating, such as that described in Eldada, both regions are reflective at a certain wavelength. The reflected wavelength (λ_B), called the Bragg wavelength, is defined by the relationship: $\lambda_B = 2n\Lambda$, where n is the effective refractive index of the grating (basically an average of indices n_1 and n_2) and Λ is the grating period. In the case of apodised Bragg gratings, the grating period of the grating is constant, while apodisation may be achieved by varying the refraction index difference along the grating length.

The claimed integrated optical device has a completely different structure from the device described in Eldada, at least because Eldada's devices includes a Bragg grating with only reflective cells. According to the claimed integrated optical device, a transmissive pair (*i.e.*, transmissive cell) constitutes a sort of defect in a regular structure (*i.e.*, a conventional Bragg grating) comprising only reflective cells. This is supported by the description in Applicants' specification at, for example, p. 25, line 24 to p. 26, line 8.

This significant structural difference between the claimed invention and Eldada makes the claimed integrated optical device operate in a completely different way from (and in some

sense in an opposite way to) Eldada's device. Thus, as shown in Applicants' Fig. 6, by exemplary reference only, all wavelengths in a wavelength band (SB) are blocked, except for a pass band (PB1 or PB2) corresponding at least to a channel of the WDM signal. The SB is at least as wide as the overall wavelength spectrum region occupied by the WDM signal. *See also* Applicants' specification at, for example, p. 9, lines 5-9.

Neither Eldada nor Nesnidal refer to apodised grating structures. Moreover, it is the way that the apodisation is achieved according to the claimed invention that is novel and nonobvious, at least because the claimed refractive index structure (*i.e.*, grating structure) achieves apodisation by varying the dimensions of the transmissive pairs (*i.e.*, transmissive cells) or the distribution of the reflective pairs (*i.e.*, reflective cells).

Finally, the disclosure of Nesnidal is unrelated to the technical field of the present application, and unrelated to the field of Eldada. Nesnidal is concerned only about a generic optical device having a diffraction grating with a large coupling coefficient, for applications such as distributed feedback optical filters and optical couplers. *See Nesnidal*, paragraphs [0004] and [0007]. Nesnidal provides no details on the type of grating, since its disclosure concerns only a technology of device fabrication.

Thus, the Examiner's "noticed facts" are in error, and cannot be considered common knowledge or well-known in the art. Based on the reasoning just presented, and notwithstanding Nesnidal's inapplicability, there cannot be "such a transmissive pair [of] regions in the described grating" of Eldada. *See* Final Office Action, p. 3. Moreover, "varying a dimension of light transmissive regions along a light propagation direction," even if it is "well-known in producing apodized grating structures," is not capable of instant and *unquestionable* demonstration as being well known. *See Id.* As Applicants have discussed above, it is the way that the apodisation is

achieved according to the claimed invention that is novel and nonobvious. That is, the grating structure (*i.e.*, refractive index structure) according to the claimed invention achieves apodisation by varying the dimensions of the transmissive cells (*i.e.*, transmissive pairs) or the distribution of the reflective cells (*i.e.*, reflective pairs). This is different from either or both of Eldada and Nesnidal—neither reference can produce the claimed invention, and neither reference is capable of supporting the Examiner’s allegation that there must be a “transmissive pair [of] regions in the described grating” of Eldada. *Id.*

Therefore, a *prima facie* case of obviousness has not been established for at least the reasons that: (1) the prior art, taken alone or in combination, fails to teach or suggest each and every element recited in at least independent claim 24, and (2) the Examiner’s presumed taking of Official Notice in a Final Office Action is improper. Since Applicants have demonstrated the impropriety of the Official Notice, the Examiner *must*, at minimum, *provide documentary evidence in the next Office action if the rejection is to be maintained*. See M.P.E.P.

§ 2144.03(C). Claim 24 should therefore be allowable. Independent claims 41 and 43, while of different scope, recite elements similar to those in independent claim 24. Claims 41 and 43 should therefore also be allowable. Dependent claims 25-28, 31, 33-40, 42, and 44-47 should be allowable at least due to their respective dependence from base claim 24, 41, or 43. Applicants therefore request reconsideration and withdrawal of the 35 U.S.C. § 103(a) rejection.

Conclusion:

In view of the foregoing, Applicants request reconsideration of the application and withdrawal of the rejections. Pending claims 24-28, 31, and 33-47 are in condition for allowance. Applicants therefore request a favorable action.

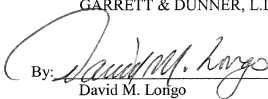
If there are any remaining issues or questions, Applicants request the Examiner telephone the undersigned representative to discuss them.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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